

WHAT IS CLAIMED:

1. A method of melting a solid at temperature below the melting temperature of the solid at a preset pressure, the method comprising:
inserting the solid into a substantially spherical envelope;
sealing the envelope at the preset pressure; and
heating the solid in an oven at an oven temperature substantially below the melting temperature of the solid at the preset pressure and for a time sufficient to melt the solid.
2. A method of vaporizing a substance at temperature below the vaporizing temperature of the substance at a preset pressure, the method comprising:
inserting the substance into a substantially spherical envelope;
sealing the envelope at the preset pressure; and
heating the substance in an oven at an oven temperature below the vaporizing temperature of the substance at the preset pressure and for a time sufficient to vaporize the substance.
3. A method of vaporizing a substance at temperature below the vaporizing temperature of the substance at a preset pressure, the method comprising:
inserting the substance into an envelope shaped to create an electron vortex of electrons emitted from the substance;
sealing the envelope at the preset pressure; and
heating the substance in an oven at an oven temperature below the vaporizing temperature of the substance at the preset pressure and for a time sufficient to generate electron emissions from the substance and create the electron vortex which allows vaporization of the substance at an oven temperature below the vaporizing temperature of the substance at the preset pressure.
4. The method of Claim 3, wherein the electron vortex creates a magnetic confinement field without external excitement.
5. The method of Claim 3, wherein the electron vortex accelerates the emission of electrons in the substance which increases the heat of the substance above that of the oven temperature.

6. A method of vaporizing a substance at temperature below the vaporizing temperature of the substance at a preset pressure, the method comprising:
inserting the substance into an envelope shaped to create a plasma flow from electrons emitted from the substance;

sealing the envelope at the preset pressure; and

heating the substance in an oven at an oven temperature below the vaporizing temperature of the substance at the preset pressure and for a time sufficient to generate electron emissions from the substance and create the plasma flow which allows vaporization of the substance at an oven temperature below the vaporizing temperature of the substance at the preset pressure.

7. The method of Claim 6, wherein the plasma flow creates a magnetic confinement field without external excitement.

8. The method of Claim 6, wherein the plasma flow accelerates the emission of electrons in the substance which increases the heat of the substance above that of the oven temperature.

9. A method of coating a substrate with a substance at temperature below the vaporizing temperature of the substance at a preset pressure, the method comprising:

inserting the substance and the substrate into a substantially spherical envelope;

sealing the envelope at the preset pressure;

heating the substance in an oven at an oven temperature below the vaporizing temperature of the substance at the preset pressure and for a time sufficient to vaporize the substance; and

reducing the heat in the oven to deposit the vapors on the substrate.

10. The method according to Claim 9, wherein the substrate is one of metal and ceramic.

11. The methods of Claims 2, 3, 5 and 9, wherein the oven temperature is below the melting temperature of the substance at the preset pressure.

12. The methods of Claims 2, 3, 5 and 9, wherein the oven temperature is between 30% and 40% of the vaporizing temperature of the substance at the preset pressure.

13. The methods of Claims 1, 2, 3, 5 and 9, wherein the preset pressure is substantially a vacuum.

14. The methods of Claims 1, 2, 3, 5 and 9, wherein the envelope is tear-shaped.

15. The methods of Claims 1, 2, 3, 5 and 9, wherein the envelope is ovoid-shaped.

16. The methods of Claims 1, 2, 3, 5 and 9, wherein the envelope is elliptically-shaped.

17. The methods of Claims 1, 2 and 3, wherein the substance is inserted in a substantially spherical crucible, and the crucible is placed in the envelope.

18. The methods of Claims 1, 2, 3 and 5, wherein the substance is inserted in a substantially spherical crucible, the crucible is placed in a substantially spherical enclosure and the enclosure is placed in the envelope.